

REMARKS

Claims 1-6 and 9-11 are currently pending in this application. Claims 1 and 5-6 are amended. New claims 9-11 are added and original claims 7-8 are cancelled without prejudice.

The remaining claim amendments, as shown above, are intended to obviate the 37 CFR 1.75 double patenting rejection advanced by the Examiner. The differences between original claim seven and original claim five are now presented as dependent claims 9-10.

The Examiner rejected independent claims 1-4 under 35 U.S.C. § 102(b) as being anticipated by US Patent No. 4,676,487 to Kudinov et al. (hereinafter "Kudinov"). The Examiner's rejection has been carefully considered but is respectfully traversed.

Claim 1 recites a cooling system for an oxygen based metallurgical converter having a vessel supported in a trunnion ring. The trunnion ring has an interior surface and a portion of the vessel being in a spaced relationship from the interior surface of the trunnion ring. The cooling system comprises one or more cooling panels. Each of the cooling panels includes a bracket for coupling to the trunnion ring. The cooling panels are mounted to the surface of the trunnion ring and are positioned adjacent the vessel. It is respectfully submitted that Kudinov fails to disclose or teach the features as defined in independent claim 1. In contrast to the arrangement presently claimed, Kudinov fails to teach or suggest cooling panels having brackets for mounting to the surface of the trunnion ring that supports a vessel. Kudinov states:

In the vertical plane the openings 2 have the form of a trapezium which is to be directed at its smaller base into the furnace chamber. The openings 2 are filled with a refractory material 3. Firebricks, refractory blocks or refractory packing mass may be utilized as the refractory material 3. Filling said openings may be carried out using such conventional methods as pouring hot metal on bricks or blocks by laying bricks or blocks, or packing with a refractory mass. (Column 2, ll. 24-32, emphasis added)

As such, Kudinov is directed towards cooling plates mounted inside a furnace chamber. Kudinov is completely silent about cooling plates designed to couple to a furnace vessel, much less the trunnion ring that supports the vessel. Kudinov fails to teach or suggest a vessel or a

trunnion ring. Because Kudinov does not disclose each and every feature as defined in claim 1, it is submitted that independent claim 1 is not anticipated by Kudinov.

The Examiner further rejected independent claims 1-8 under 35 U.S.C. § 103(a) as being unpatentable over Kudinov in view of the background section of the present application. The Examiner's rejection has been carefully considered, but is respectfully traversed. With all due respect, it is believed that the Examiner has mischaracterized the background section of the present application. Paragraph 3 of the application states:

In the art, various approaches have been taken to reduce the effects of the thermal loads and stresses on the converter vessel and/or the trunnion ring. Known approaches include attaching a cooling system directly to the vessel; running cooling fluid through the interior cavities of the trunnion ring; and incorporating a fluid or a vapor based cooling system into the interior of the trunnion ring. (Paragraph 3 of the application, as originally filed, emphasis added)

As stated, conventional solutions cool interior cavities of the trunnion ring, which, as will be appreciated, is expensive to manufacture. Conventional solutions also fail to prevent temperature gradients from existing on the surface of the trunnion ring, since the trunnion ring is cooled on the inside, thus resulting in deformation of the trunnion ring.

The present invention as defined by independent claim 1 comprises a vessel and a trunnion ring with cooling panels mounted to the surface of the trunnion ring. The cooling panels are located between the trunnion ring and the vessel, as claimed in claim 5, thus preventing the heat from ever reaching the trunnion ring. As such, the present invention provides a highly desirable trunnion ring that may be smaller and cheaper (i.e., not requiring interior cavities for cooling) and is not subject to deformation from temperature gradients, thus lasting longer. In addition, the structure of the cooling panels facilitates maintenance, repair and/or replacement.

It is further submitted that Kudinov explicitly teaches away from the present invention because Kudinov describes cooling plates that are designed to be mounted in the furnace chamber. The openings 2 are filled with a refractory material 3. (Column 2, ll. 24-32) As such, the cooling plates disclosed by Kudinov are unsuitable to be mounted on a vessel

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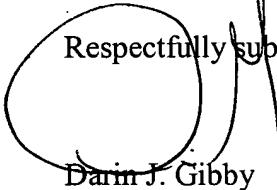
or trunnion ring, as presently claimed. In contrast to the Examiner's assertion that Kudinov teaches "improved cooling panels for cooling metallurgical vessels" (Page 4 of the Office Action, dated January 14, 2005), the sole purpose disclosed by Kudinov for the cooling plate is in a metallurgical furnace (e.g., "blast furnaces") (Column 2, ll. 52-53). It is submitted that in view of these differences there is no motivation or suggestion for one skilled in the art to modify the teachings of Kudinov and therefore the invention as defined by independent claims 1 and 5 is not obvious. Furthermore, even if one skilled in the art were to modify the teachings of Kudinov, the resulting arrangement would not be the same as that defined by independent claims 1 and 5. Therefore, independent claims 1 and 5 are not obvious in view of Kudinov. Since claims 2-4, 6, and 9-11 depend, either directly or indirectly, from claims 1 and 5, it is submitted that these claims are also not obvious for the same reasons as discussed above.

In view of the foregoing, the applicant respectfully requests that the rejections be withdrawn. Favorable reconsideration and allowance of this application are respectfully requested.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 303-571-4000.

Respectfully submitted,

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